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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/850,162	05/08/2001	Tatsuyuki Saito	501.39868X00	9657

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EXAMINER

POMPEY, RON EVERETT

ART UNIT PAPER NUMBER

2812

DATE MAILED: 05/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Supplemental Office Action Summary

Application No.

09/850,162

Applicant(s)

SAITO ET AL.

Examiner

Ron E Pompey

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17, 37 and 39 - 58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 37 and 39 - 58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

SUPPLEMENTAL FINAL REJECTION

Examiner's Note

1. The examiner has considered the Supplemental Amendment, filed 10-10-02, but not matched to the case before the final, mailed 1-17-03, was mailed. A new rejection and the restart for response to the supplemental final rejection is set forth.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-17, 37 and 39-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uozumi (US 6,261,953) in further view of Omura (US 6,028,362), Berman (US 5,893,756) and Maeda (JP 11-016906).

Uozumi discloses the steps of:

forming a groove for wiring in a first insulating film formed on a semiconductor substrate;

successively forming a barrier layer and a conductive film over said first insulating film including the inside of said groove for wiring and removing said barrier layer and said conductive film from outside of said groove for wiring (2, 3 fig. 3A), thereby forming a wiring;

forming a cap conductive film (4, fig. 3A) on said wiring; and

forming a second insulating film over said cap conductive film and said first insulating film (11, fig. 3A) (col. 7, ln.23 – col. 8, ln. 12).

Omura discloses the limitations the materials that are claimed for the cap conductive layer (60, fig. 15) and forming plug (52s, d, fig. 16) to the semiconductor device (col. 10, lns. 40-62 and col. 13, ln. 65 – col. 14, ln. 61), besides other features of the claimed device. Therefore it would have been obvious to combine Omura with Uozumi, because those materials are good oxidation preventing materials and conductive plugs provide for electrical contact for between devices.

Maeda discloses the limitation of selective growth of cap layer (11b, fig. 3(d)) on metal plug and Berman discloses the limitation for cleaning of a substrate surface (fig. 3) after contaminants are formed on insulator after each CMP process (col.4, lns. 31-40). Therefore, it would have been obvious to combine Omura and Uozumi with Maeda and Berman, because the selectively growing the cap layer would reduce process steps and the cleaning steps after the CMP of the each metal contacts remove unwanted contaminants in the dielectric layer.

Response to Arguments

4. Applicant's arguments with respect to claims 1-17, 37 and 39-58 have been fully considered but they are not persuasive .

The applicant argues that the prior art of record does not disclose the cleaning of the insulator after each CMP is performed. The examiner Berman reference shows that it is well known to clean the surface of a substrate after CMP of a metal contact to

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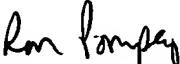
remove contaminants in the dielectric layer. The examiner sees this as a process that will be done each time the metal plug is formed to keep the integrity of the dielectric.


Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ron E Pompey whose telephone number is (703) 305-3016. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.


Ron Pompey
Art Unit: 2812
May 22, 2003


John F. Niebling
Supervisory Patent Examiner
Technology Center 2800